

Appl. No. 10/711,507
Reply to Office action of August 23, 2007

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Amendments to the Claims

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

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Claim 1 (currently amended): A method for controlling a stepping motor in an optical storage system, which comprises a pick-up head for achieving a short seek, and an object lens, the method comprising:

calculating a number of steps that the stepping motor should rotate;
10 moving the pick-up head toward a target position by having the stepping motor rotate according to the number of steps;
determining a shift distance between the object lens and the center of the pick-up head; and
15 ~~selectively stopping~~ controlling movement of the pick-up head according to the shift distance ~~before the short seek is achieved.~~

Claim 2 (previously presented): The method of claim 1, wherein the pick-up head is placed on a sled, the sled being electrically connected to the stepping motor, and the step of moving the pick-up head toward a target position by having
20 the stepping motor rotate according to the number of steps further comprises: utilizing the stepping motor for driving the sled to move the pick-up head toward the target position.

Claim 3 (previously presented): The method of claim 1, further comprising moving
25 the object lens toward a target track.

Claim 4 (original): The method of claim 3 further comprising:
moving the object lens from an initial track to the target track according to a predetermined speed; and
30 determining at least one step according to a distance between the initial track

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and the target track.

5 Claim 5 (currently amended): The method of claim 3, wherein the step of selectively stopping movement of the pick-up head according to the shift distance further comprises:

10 stopping utilizing the stepping motor to move the pick-up head if the shift distance is lower than a predetermined shift range, while the object lens has not reached the target track, and the stepping motor has not moved the pick-up head to the target position ~~rotated according to the number of steps;~~ and

15 utilizing the stepping motor to move the pick-up head if the shift distance is greater than the predetermined shift range, while the object lens has not reached the target track, and the stepping motor has not moved the pick-up head to the target position ~~rotated according to the number of steps.~~

Claim 6 (original): The method of claim 1, wherein the optical storage system further comprises a control module for controlling operations of the stepping motor, the pick-up head, and the object lens.

20 Claim 7 (currently amended): A method of achieving a short seek in an optical storage system, the optical system having a stepping motor, a pick-up head, and an object lens, the method comprising:

(a) calculating a number of steps that the stepping motor should rotate;
25 (b) after step (a), utilizing the stepping motor to move the pick-up head toward a target position ~~and move the object lens toward a target track at the same time;~~

(c) determining if the object lens has reached the target track, wherein the short seek is finished if the object lens has reached the target track; otherwise, step (d) is performed; and

30 (d) continuing to move the object lens until the pick-up head has reached the

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target position and then returning to step (c); otherwise, repeating step (d).

Claim 8 (original): The method of claim 7 further comprising:

- 5 (e) during step (d), when the pick-up head has not reached the target position and the object lens has not reached the target track, checking if a shift distance is lower than a predetermined shift range; if true, then stopping utilizing the stepping motor to move the pick-up head; otherwise, going to step(f); and
- 10 (f) continuing to utilize the stepping motor to drive the pick-up head according to a predetermined speed, and then returning to step (e); wherein the shift distance is between the object lens and a center of the pick-up head.

15 Claim 9 (original): The method of claim 7, wherein the pick-up head is placed on a sled, the sled is electrically connected to the stepping motor, and step (b) utilizes the stepping motor to drive the sled.

20 Claim 10 (currently amended): The method of claim 7 further comprising: a step (b')
to move the object lens toward a target track, wherein the step (b') and step (b)
comprise:

(g) in step (b'), moving the object lens from an initial track to the target track according to a predetermined speed curve; and

25 (h) in step (b), calculating the number of steps that the stepping motor should rotate according to a distance between the initial track and the target track.

Claim 11 (currently amended): The method of claim ~~[[7]]~~ 10, wherein the stepping motor and the object lens move along a radial direction ~~in step (b)~~.

30 Claim 12 (original): The method of claim 7, wherein the optical storage system further

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comprises a control module for controlling operations of the stepping motor, the pick-up head, and the object lens.

Claim 13 (currently amended): An optical storage system comprising:

- 5 a sled placed movably in the optical storage system;
a pick-up head placed on the sled;
an object lens placed movably on the pick-up head;
a stepping motor electrically connected to the sled for driving the sled to
move the pick-up head, wherein and stepping the stepping motor stops
10 the sled and the pick-up head when a shift distance corresponding to a
distance between the pick-up head and the object lens is lower than a
predetermined range; and
a control module electrically connected to the stepping motor, the pick-up
head, and the object lens for controlling operations of the stepping motor,
15 the pick-up head, and the object lens and determining the shift distance
and the predetermined range.

Claim 14 (previously presented): The optical storage system of claim 13, wherein the sled and the object lens move along a radial direction.

Claim 15 (previously presented): The optical storage system of claim 13, wherein the shift distance is a distance between the object lens and a center of the pick-up head.

Claim 16 (previously presented): The optical storage system of claim 13, wherein the stepping motor is implemented for a short seek.

Claim 17 (previously presented): An optical storage system comprising:

- 30 a sled placed movably in the optical storage system;
a pick-up head placed on the sled;

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- an object lens placed movably on the pick-up head;
a stepping motor, electrically connected to the sled, for driving the sled to
move the pick-up head if a shift distance corresponding to a distance
between the pick-up head and the object lens is greater than a
predetermined range and the object lens has not reached a target position,
and stopping the sled and the pick-up head when the shift distance is
lower than the predetermined range and the object lens has not reached
the target position; and
a control module electrically connected to the stepping motor, the pick-up
head, and the object lens for calculating a number of steps that the
stepping motor should rotate and controlling operations of the stepping
motor, the pick-up head, and the object lens and determining the shift
distance and the predetermined range.
- 15 Claim 18 (previously presented): A method for controlling a stepping motor in an
optical storage system, which comprises a pick-up head for achieving a
short seek and an object lens placed movably on the pick-up head, the
method comprising:
calculating a number of steps that the stepping motor should rotate;
moving the pick-up head toward a target position by having the stepping
motor rotate according to the number of steps;
moving the object lens toward a target track;
comparing a shift distance corresponding to a distance between the pick-up
head and the object lens with a predetermined shift range;
stopping utilizing the stepping motor to move the pick-up head if the shift
distance is lower than the predetermined shift range, while the object lens
has not reached the target track, and the stepping motor has not rotated
according to the number of steps; and
utilizing the stepping motor to move the pick-up head if the shift distance is
greater than the predetermined shift range, while the object lens has not

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reached the target track, and the stepping motor has not rotated according to the number of steps.